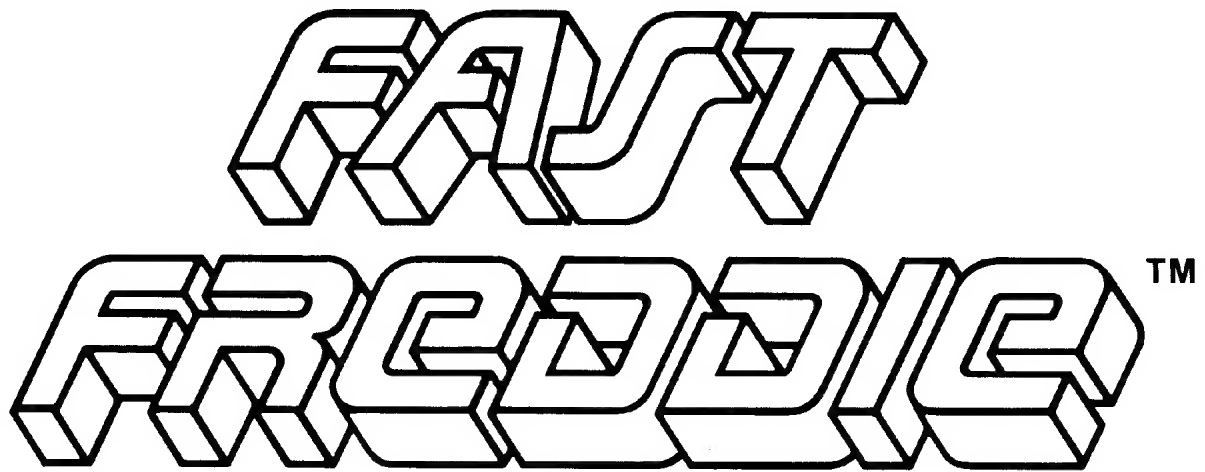


**Schematic Package Supplement  
to**



**Operation, Maintenance and Service Manual**



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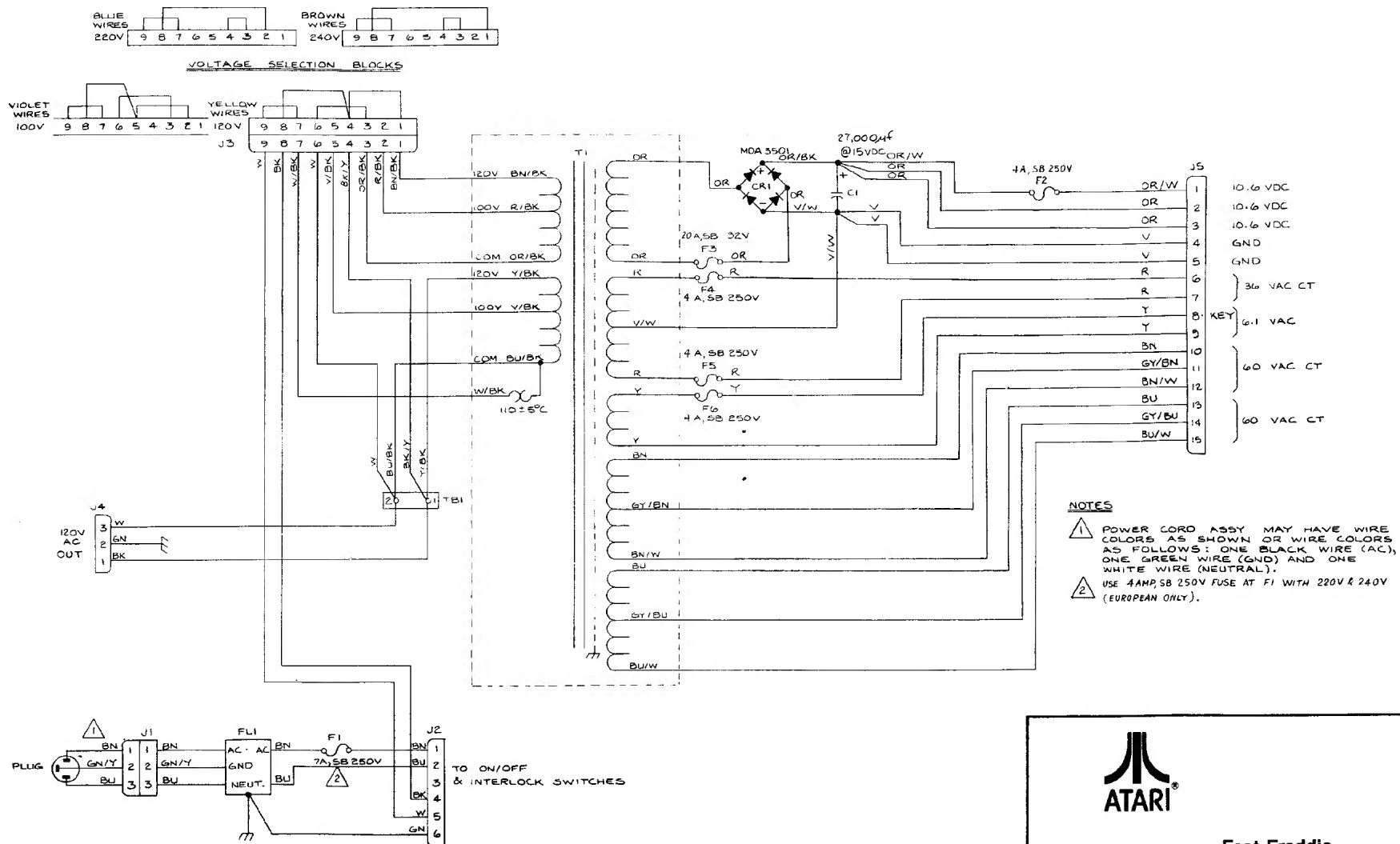
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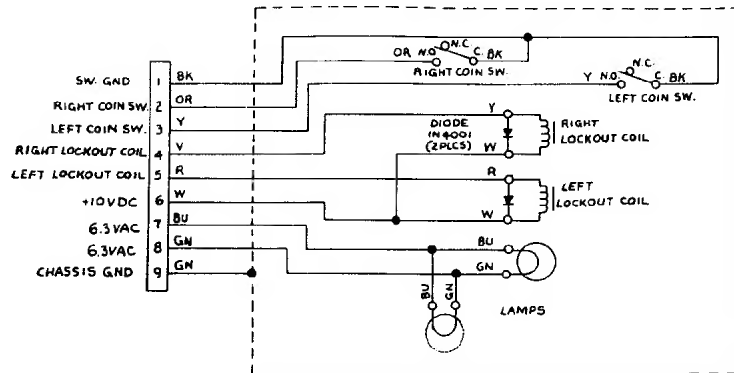
# Fast Freddie Power Supply Wiring Diagram

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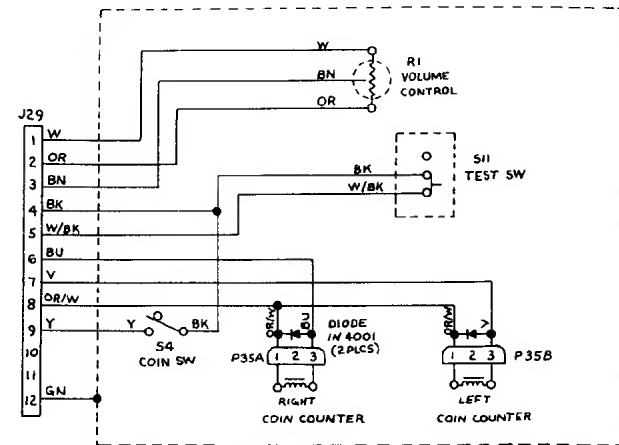
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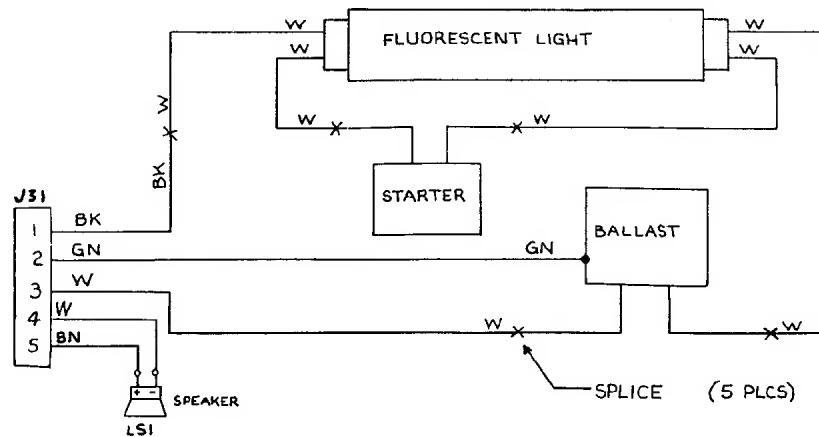
### Coin Door Wiring Diagram



### Utility Panel Wiring Diagram



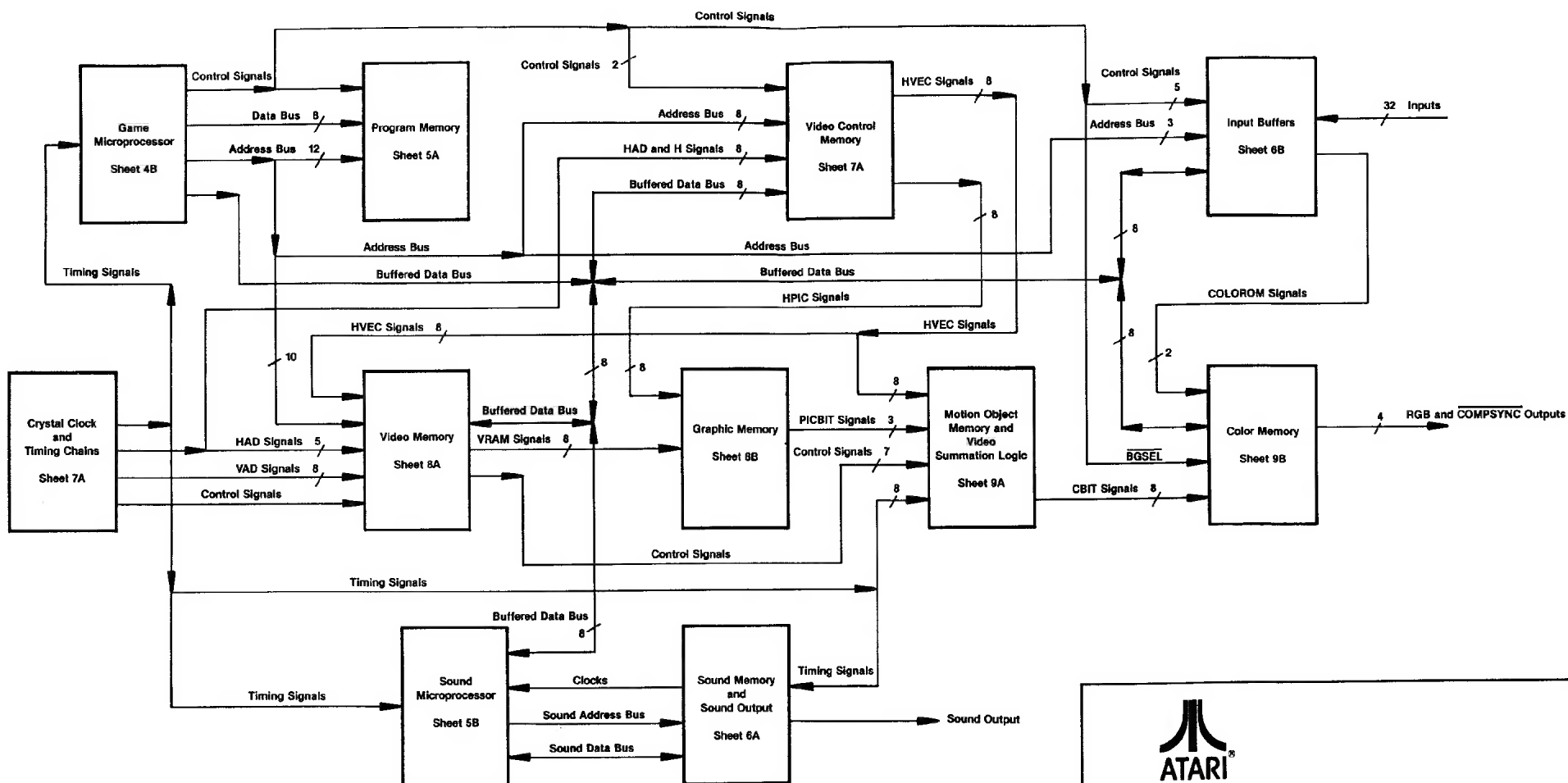
### Fluorescent Light and Speaker Wiring Diagram



### Fast Freddie Game Wiring Interfaces

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# Fast Freddie PCB Block Diagram

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# Fast Freddie PCB Connector

Soldering Face			Parts Face		
GND	A	1	GND	1	GND
SP Out	B	2	No Connection	2	No Connection
+ 12 V	C	3	+ 12 V	3	+ 12 V
+ 12 V	D	4	+ 12 V	4	+ 12 V
Sync	E	5	Green	5	Green
Red	F	6	Blue	6	Blue
1 Player Left	H	7	Coin 2	7	Coin 2
1 Player Right	J	8	Coin 1	8	Coin 1
* 2 Player Left	K	9	Test	9	Test
* 2 Player Right	L	10	1 Player Start	10	1 Player Start
1 Player Up	M	11	2 Player Start	11	2 Player Start
1 Player Down	N	12	Coin Aux. Input	12	Coin Aux. Input
* 2 Player Up	P	13	1 Player Kick	13	1 Player Kick
* 2 Player Down	R	14	* 2 Player Kick	14	* 2 Player Kick
+ 5 V	S	15	+ 5 V	15	+ 5 V
+ 5 V	T	16	+ 5 V	16	+ 5 V
GND	U	17	GND	17	GND
GND	V	18	GND	18	GND

\* No connection in upright mode.



## Fast Freddie Memory Map and PCB Connector

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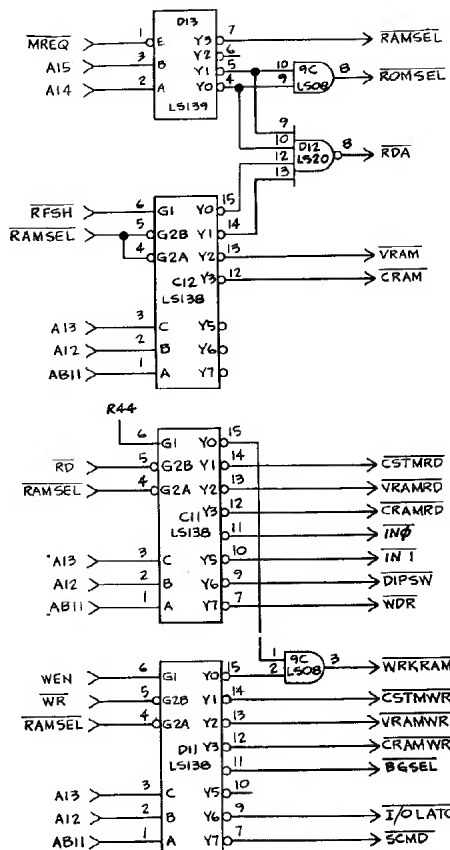
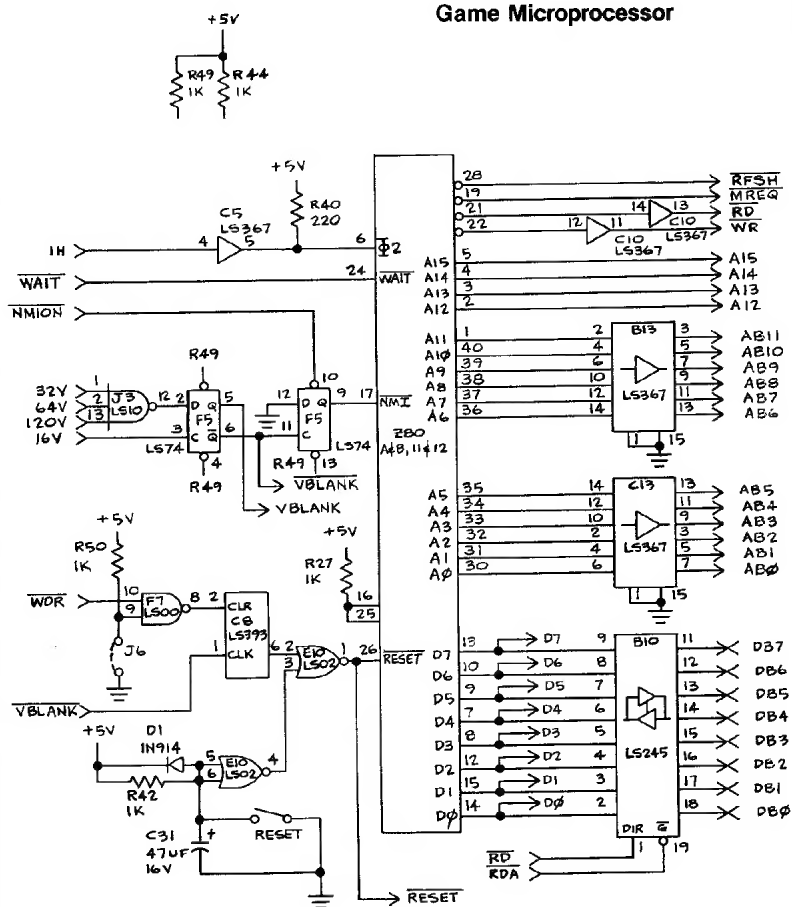
SP-208 Sheet 4A  
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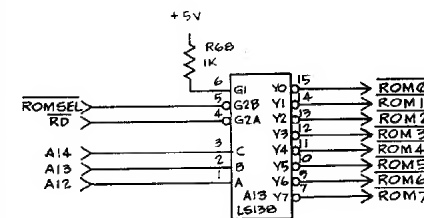
# MEMORY MAP

Game Microprocessor Memory Space										
HEXA-DECIMAL ADDRESS	R/W	DATA								FUNCTION
		D7	D6	D5	D4	D3	D2	D1	D0	
0000-7FFF	R	D	D	D	D	D	D	D	D	Z80 32K Program ROM
C000-C7FF	R/W	D	D	D	D	D	D	D	D	2K Working RAM
C800-C8FF	R/W	D	D	D	D	D	D	D	D	Custom Chip
D000-D3FF	R/W	D	D	D	D	D	D	D	D	1K Video RAM
D800-D8FF	R/W	D	D	D	D	D	D	D	D	Control RAM
E000	W	D	D	D	D	D	D	D	D	Background Color Select
E000	R								D	Coin 2
E000	R							D		Coin 1
E000	R						D			Test
E000	R					D				1 Player Start
E000	R				D					2 Player Start
E000	R			D						Coin Aux: Input
E000	D		D							1 Player Kick
E000	R	D								2 Player Kick
E800	R								D	1 Player Left
E800	R							D		1 Player Right
E800	R						D			2 Player Left
E800	R					D				2 Player Right
E800	R				D					1 Player Up
E800	R			D						1 Player Down
E800	R		D							2 Player Up
E800	R	D								2 Player Down
F000	R	D	D	D	D	D	D	D	D	Option Switch
F000	W								D	NMI Preset
F001	W								D	Character ROM Select 1
F002	W								D	Character ROM Select 2
F003	W								D	Color ROM Select 1
F004	W								D	Color ROM Select 2
F005	W								D	Horizontal Flip
F006	W								D	Vertical Flip
F800	W	D	D	D	D	D	D	D	D	Sound Output Port (SCMD)
F800	R									Soft Reset
Sound Microprocessor Memory Space										
0000-1FFF	R	D	D	D	D	D	D	D	D	4K Sound Program ROM
2000-27FF	R/W	D	D	D	D	D	D	D	D	2K Sound Working RAM
3000	R	D	D	D	D	D	D	D	D	Input Port From Game C.P.U. (SCMDRD)
3000	W								D	SNMI Preset
5000	W	D	D	D	D	D	D	D	D	Programmable Sound Generator
5001	W	D	D	D	D	D	D	D	D	Programmable Sound Generator
6000	W	D	D	D	D	D	D	D	D	Programmable Sound Generator
6001	W	D	D	D	D	D	D	D	D	Programmable Sound Generator

## Game Microprocessor



## ROM Decoder



## Game Microprocessor Address Decoders

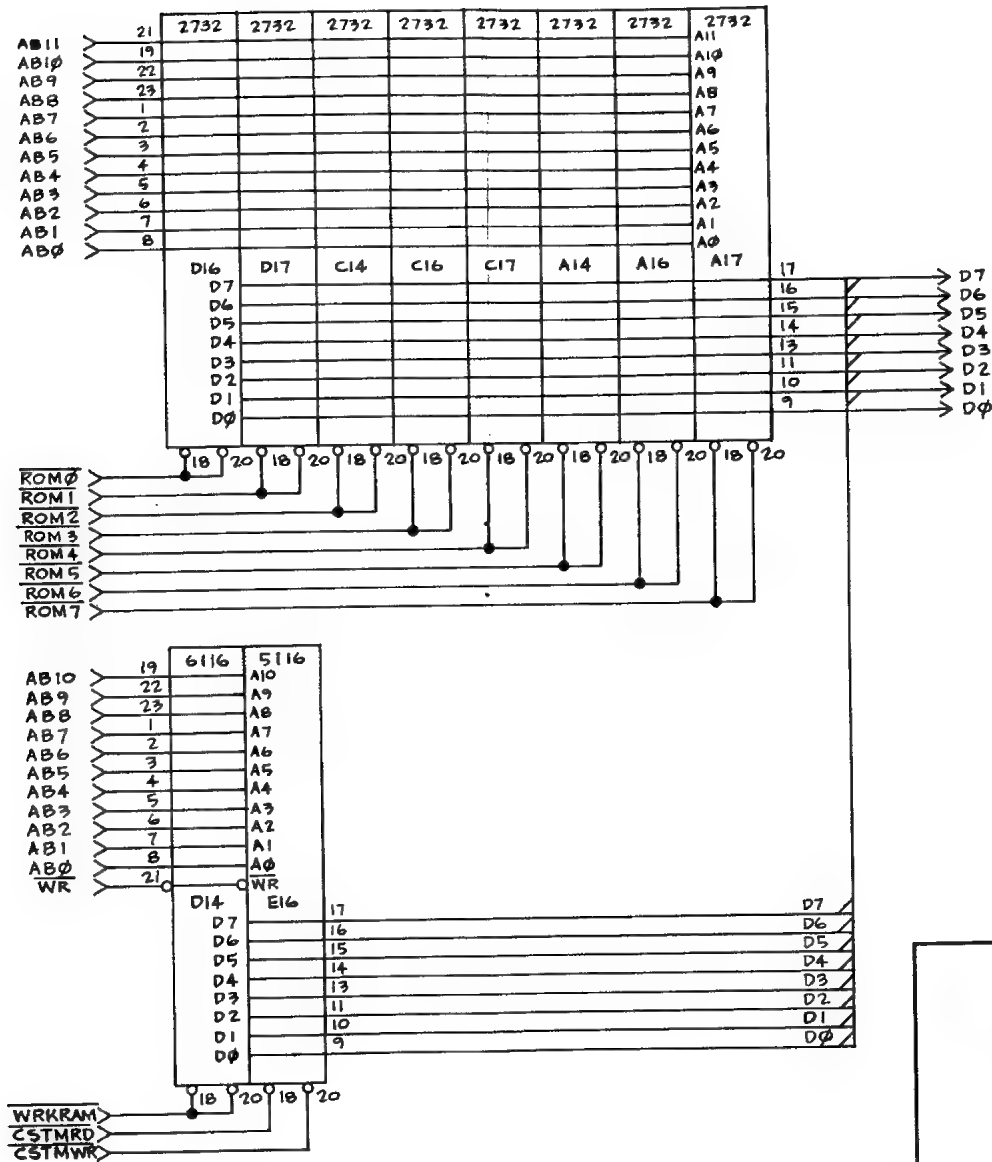


## Fast Freddie Game Microprocessor and Decoders

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# Program Memory

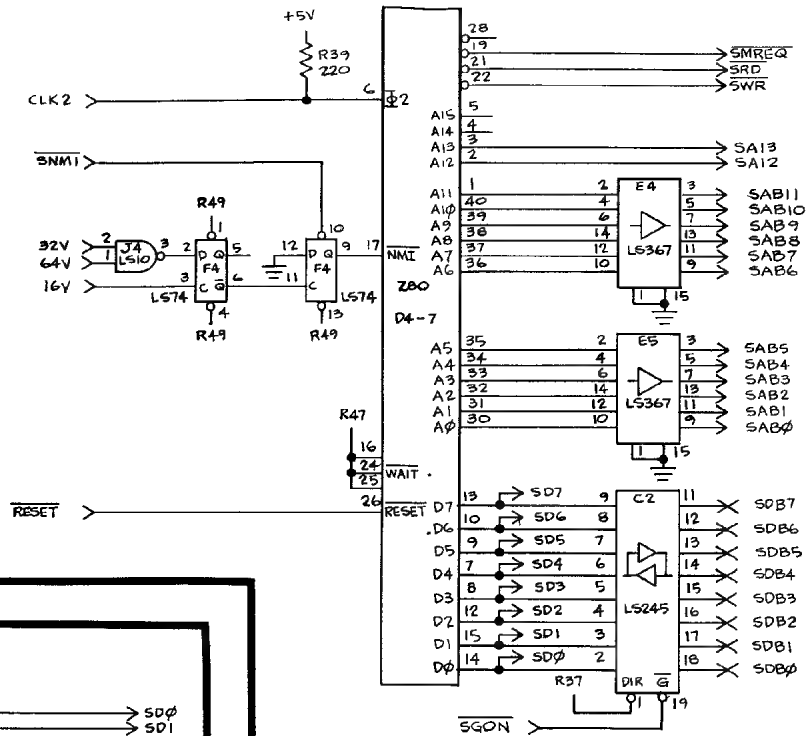


## Fast Freddie Program Memory

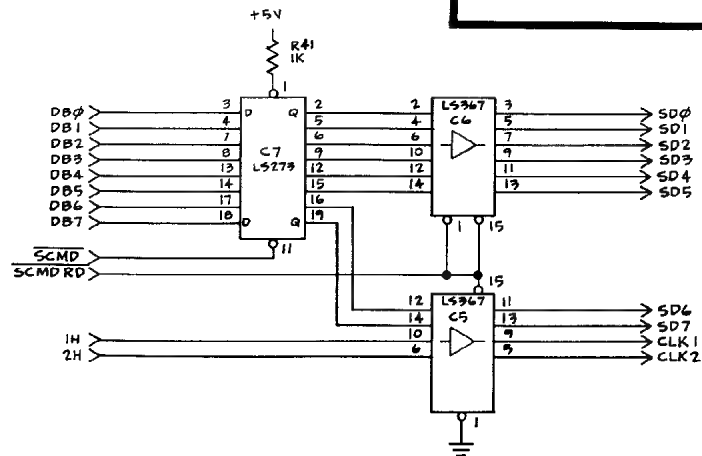
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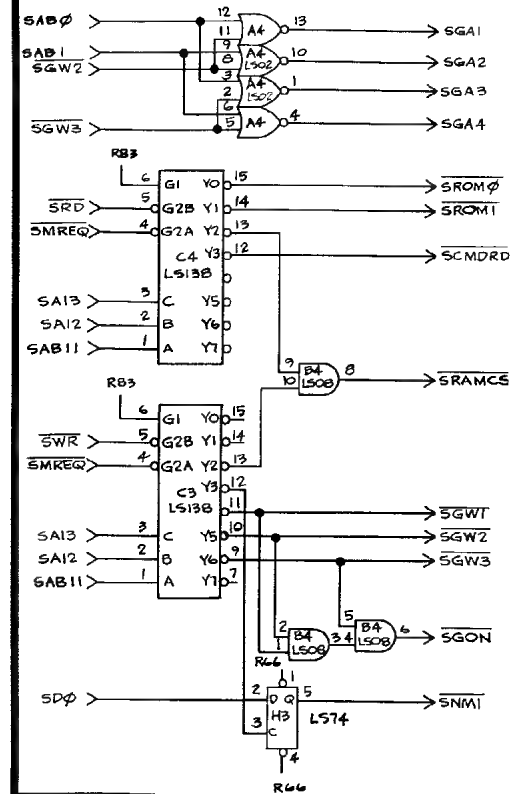
## Sound Microprocessor



## Sound Input



## Sound Microprocessor Address Decoders



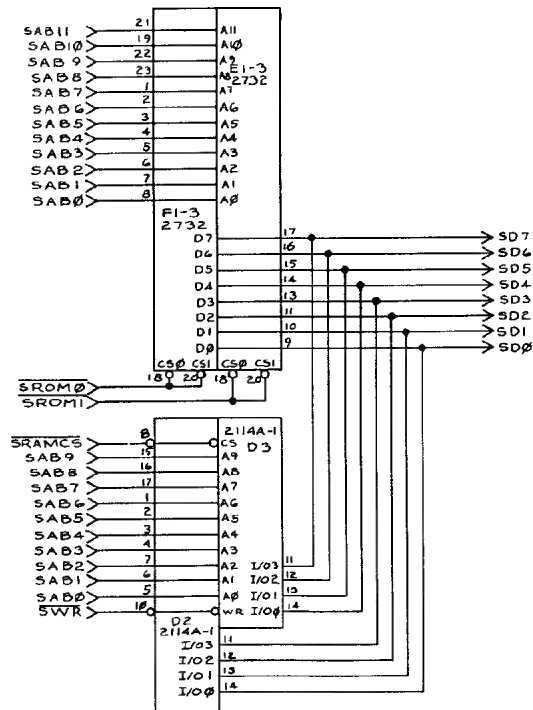
## Fast Freddie Sound Input, Microprocessor, and Decoders

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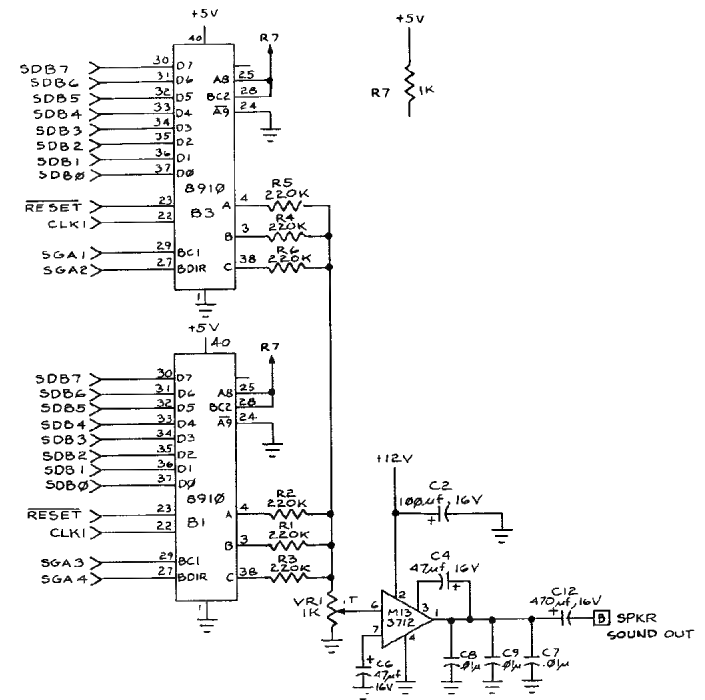
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## Sound Memory



## Sound Output

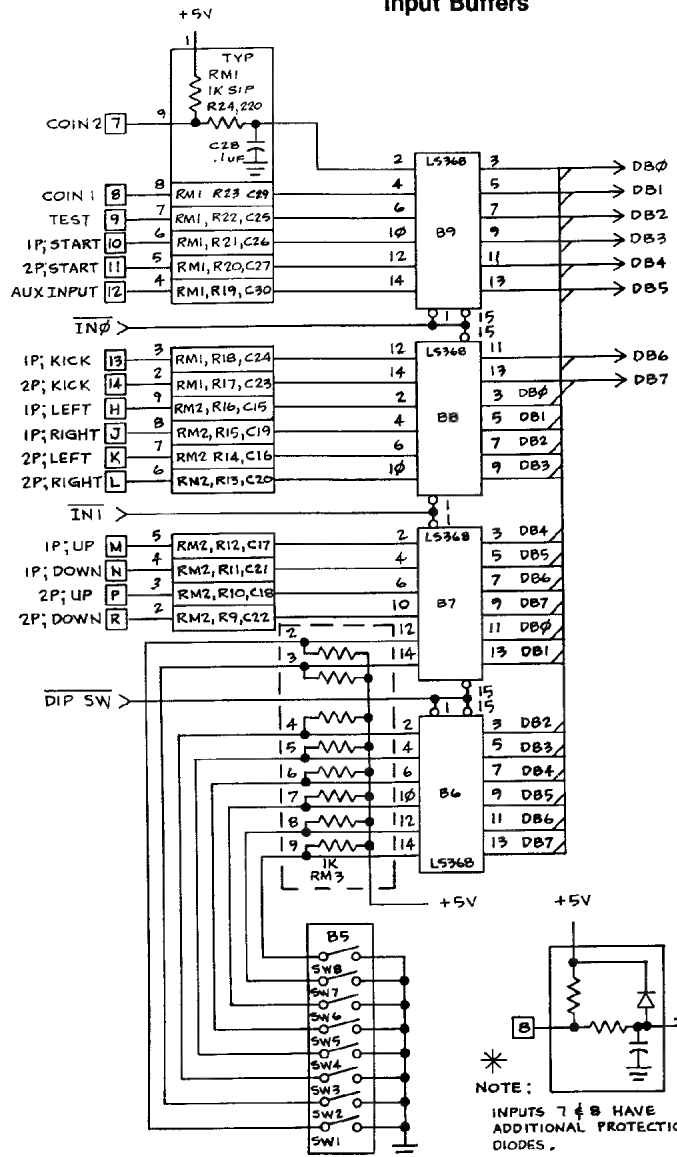


## Fast Freddie Sound Memory and Output

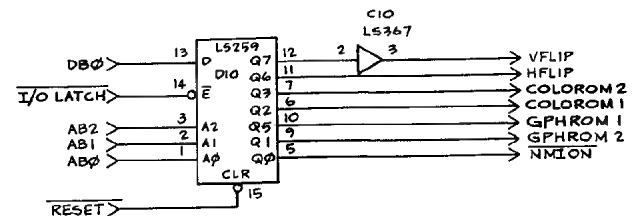
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## Input Buffers



## Control Signal Latch



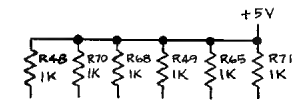
## Fast Freddie Input Buffers and Control Signal Latch

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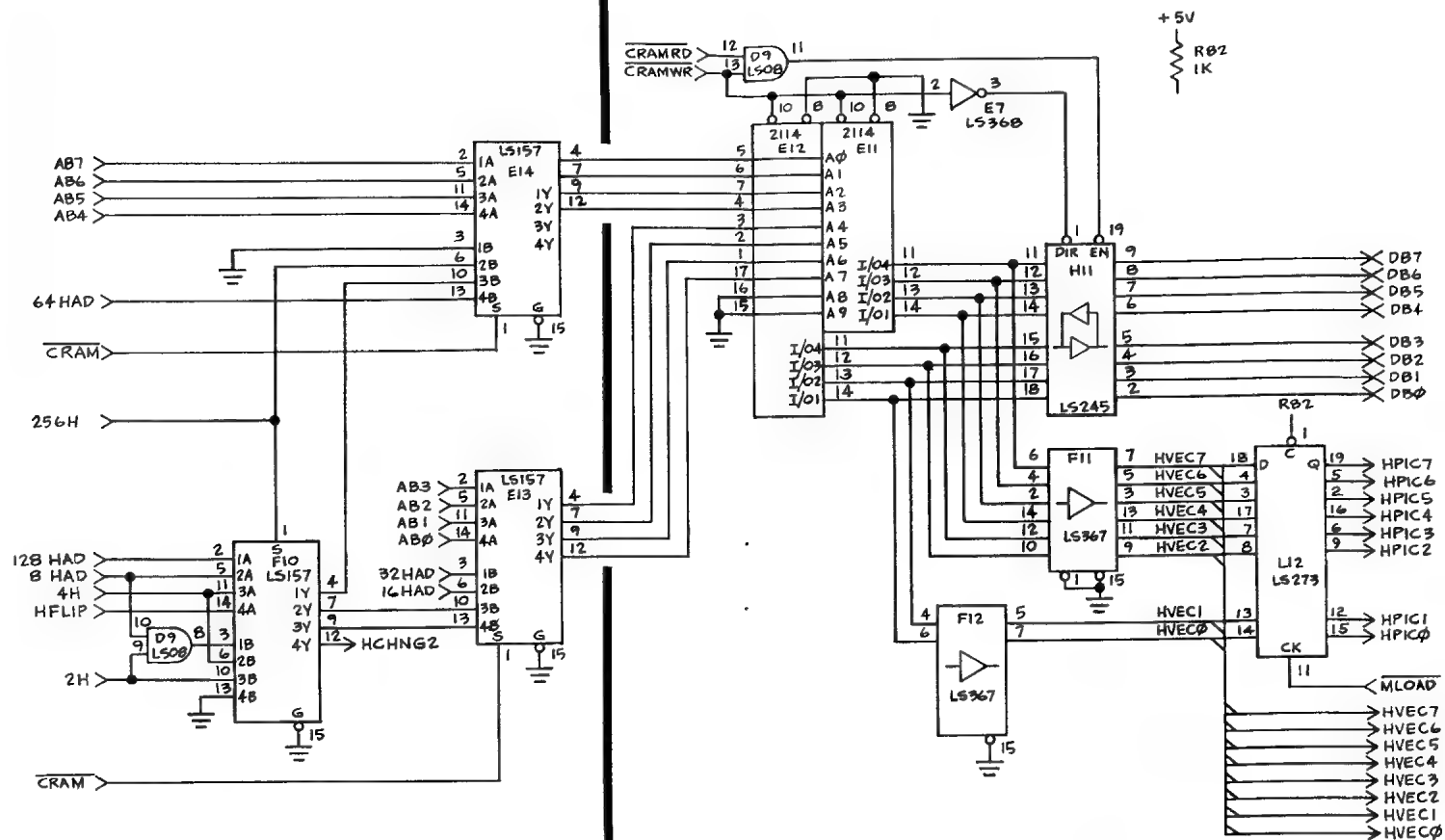
The schematic diagram illustrates a video decoder circuit. It features two LS368 comparators (A9 and A10) and two LS161 counters (A1 and A2). The circuit is powered by a 6 MHz oscillator and a 6 MHz input signal. The outputs of the comparators and counters are connected to various video signals, including HFLIP, 256H, 128H, 64H, 32H, 128HAD, 64HAD, 32HAD, 16H, 8H, 4H, 2H, 16HAD, 8HAD, IH, and I1. The circuit is labeled with component values and pin numbers.

The timing diagram illustrates the internal state of the 68000 microprocessor and its associated components (68010 and 68011) in response to various external signals. The signals shown are: 1H, 2H, 4H, 8H, 256H, 6MHz, R70, J1, J2, LS10, LS139, J1, J2, LS139, LOAD, LOAD, VPL, XSI, and MLOAD. The diagram shows the relationship between these signals and the internal state of the 68000, including the 68010 and 68011 chips.



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### Video Control RAM



## Fast Freddie Video Control Memory

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## Control Signals

The diagram illustrates the control signal logic for two integrated circuits: an LSI75 and an LS977.

**LSI75 Decoder:**

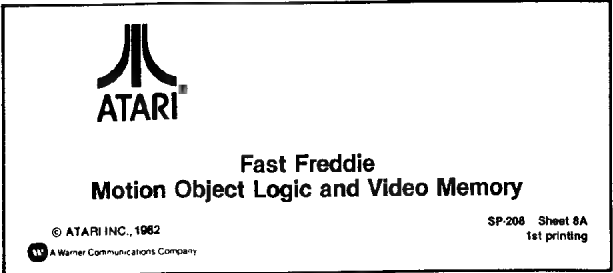
- Inputs:** HNECZ (pin 4), HVEC1 (pin 5), HVECφ (pin 13), COLD (pin 9).
- Outputs:** HFLIP 2 (pin 2), HFLIP 1 (pin 8), BLANK 25GH (pin 15).
- Internal Connections:** Pin 1 is connected to +5V through resistor R43 (1K). Pins 6 and 7 are connected to pins 14 and 15 respectively.

**LS977 Decoder:**

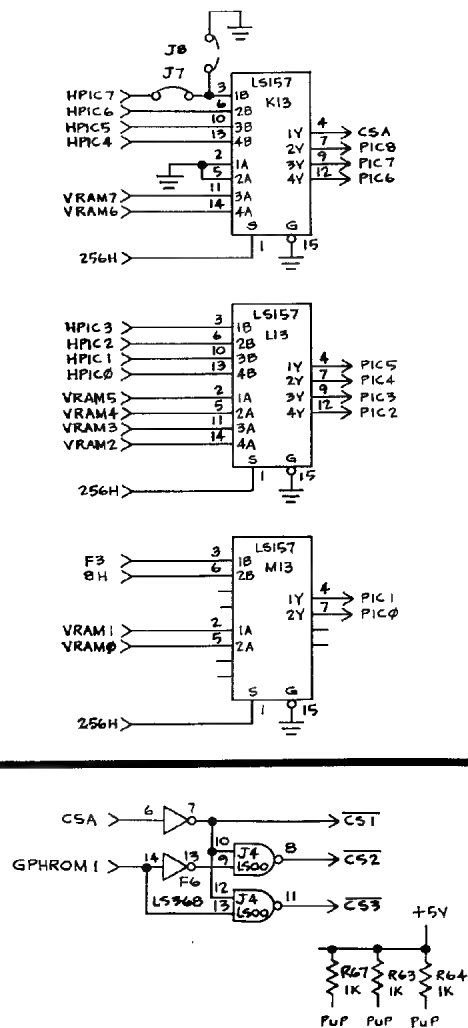
- Inputs:** CK (pin 11), EN (pin 1).
- Outputs:** XJ2 (pin 2), XJ1 (pin 15), XJφ (pin 19), HFLIP 2B (pin 7), BLANK B (pin 6), 25GHB (pin 12).
- Internal Connections:** Pin 3 is connected to pin 14, pin 4 to pin 6, pin 5 to pin 4, and pin 10 to pin 12.

**Common Inputs:**

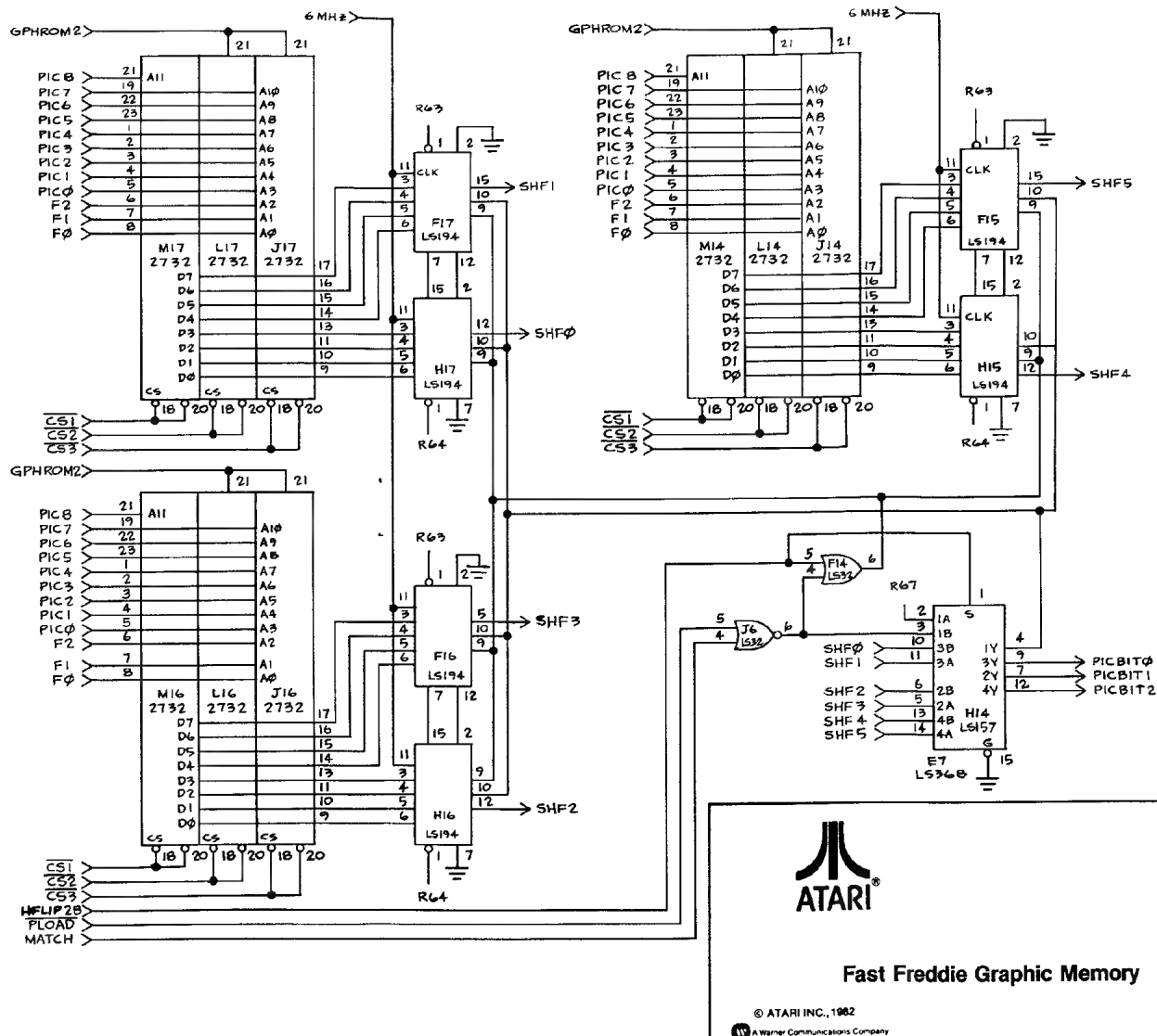
- A 6MHz clock signal is connected to pin 11 (CK) of the LS977.
- A PLOAD signal is connected to pin 1 (EN) of the LS977.



## Graphics ROM Address Multiplexers



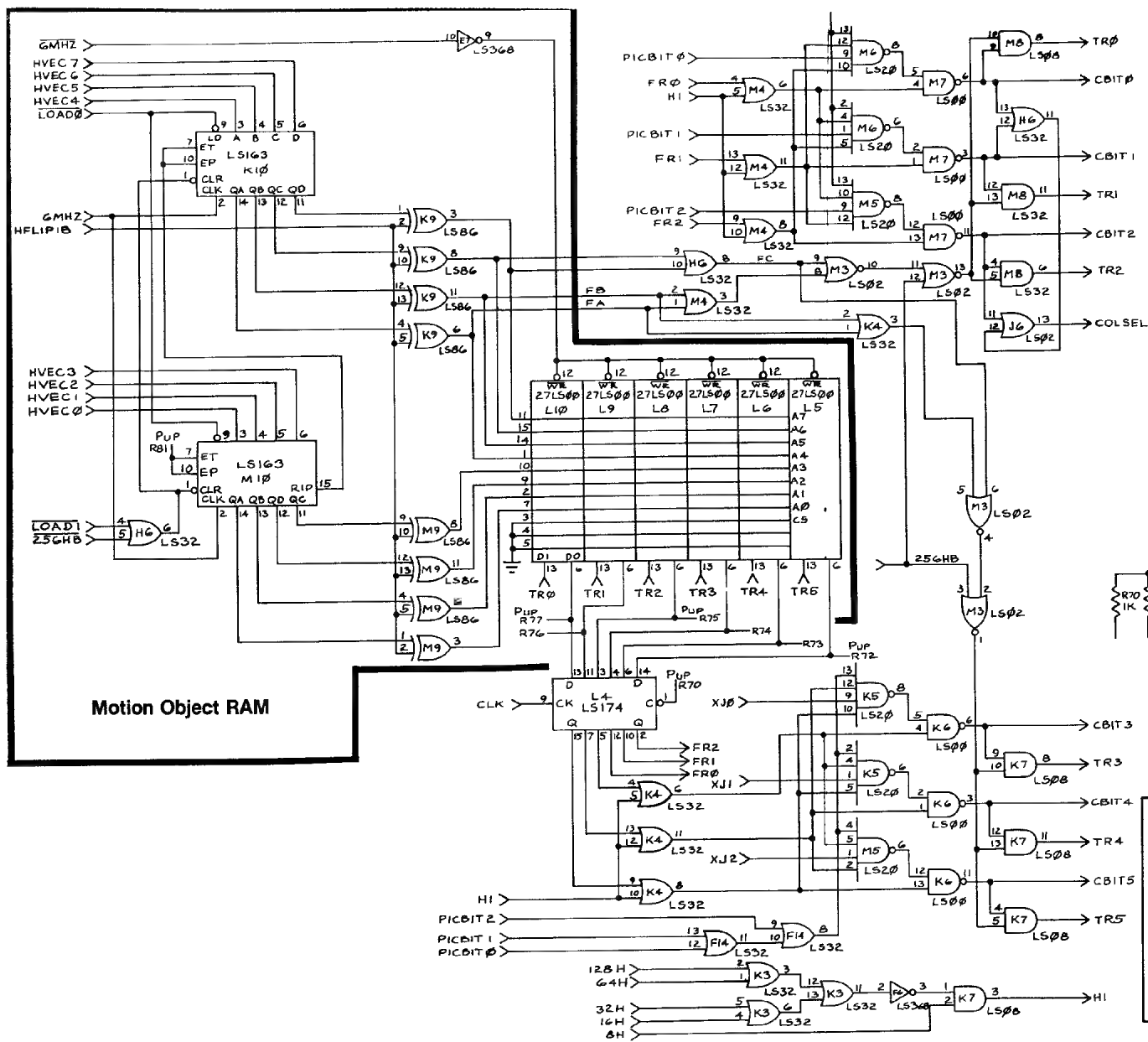
## Graphics ROM



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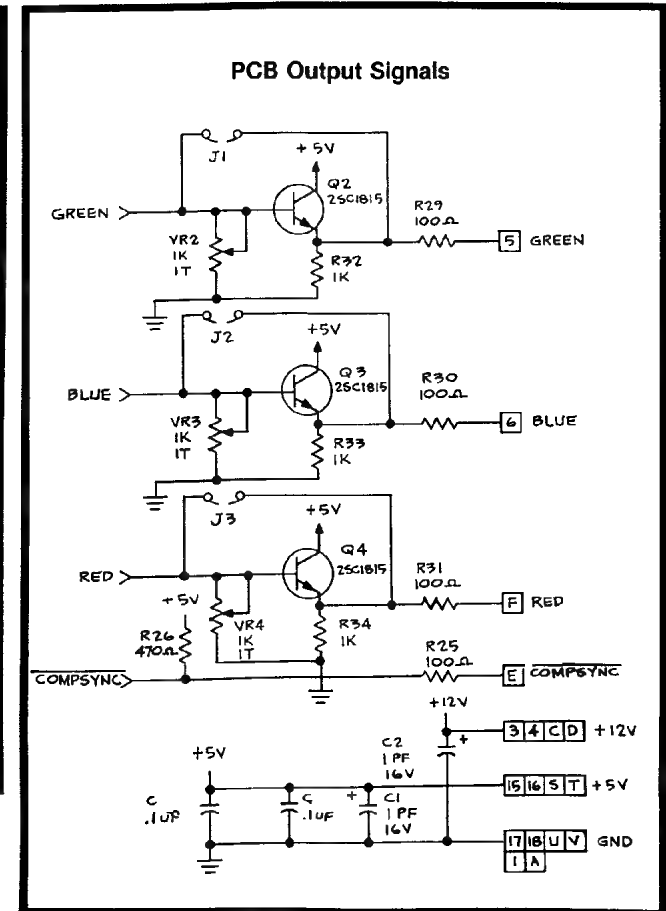
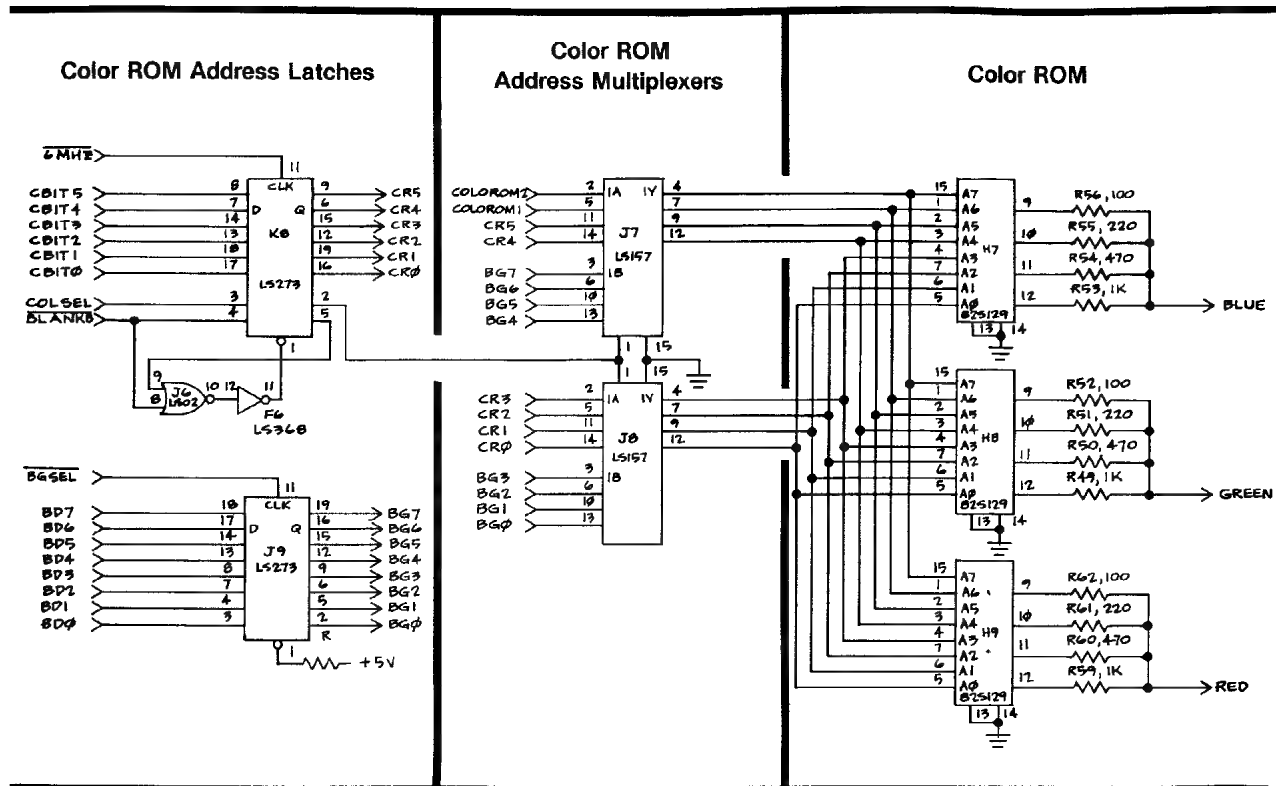
Video Summation Logic



# Fast Freddie Motion Object Memory and Video Summation Logic

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# Fast Freddie Color Memory and PCB Outputs

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# Descriptions of Signal Names for Fast Freddie PCB Schematic Diagrams

## **A12-A15**

Game Microprocessor Address Lines 12-15 are generated by the Game Microprocessor (A & B 11/12). These signals are the select input signals for Game Microprocessor Address Decoders C11, C12, D11, D13, and for ROM Decoder A13.

## **AB0-AB11**

Game Microprocessor Buffered Address Bus is generated by the Game Microprocessor (A & B 11/12), buffered by B13 and C13, and applied to the Program Memory, Video Control RAM Address Multiplexers, and Video RAM Address Multiplexers. AB0-AB2 are applied to D10. AB11 is applied to Game Microprocessor Address Decoders C11, C12, and D11.

## **BG0-BG7**

Background Color Signals 0-7 are generated by Color ROM Address Latch J9. These signals are multiplexed with the CR0-CR5, COLOROM1, and COLOROM2 signals by Color ROM Address Multiplexers J7 and J8.

## **BQSEL**

Background Color Select is generated by Game Microprocessor Address Decoder D11 and applied as the clock input signal to Color ROM Address Latch J9.

## **BLANK**

Composite Blanking Signal is generated by logic gate J6 of the Horizontal Timing Chain and applied as the select input for Video RAM Address Multiplexers K11, L11, M11. BLANK is also applied to E8 to produce BLANKB.

## **BLUE**

Blue Video Output Signal is generated by Color ROM H7, buffered by Q3, and applied to the video display circuitry for further amplification and processing.

## **CBIT0-CBIT5**

Color Bits 0-5 are generated by logic gates within K6 and M7 of the Video Summation Logic. They are then applied to the D input pins of Color ROM Address Latch K8 to produce CR0-CR5.

## **CLK**

6-MHz Clock Signal is generated at pin 3 of J-K flip-flop L2 of the Crystal Clock circuit. CLK is used to clock the D-type flip-flops within L4 of the Video Summation Logic.

## **CLK1**

Clock 1 is generated by driver C5 of the Sound Input circuit. This signal is derived from Horizontal Timing Signal 1H and is used to clock Programmable Sound Generators B1 and B3.

## **CLK2**

Clock 2 is generated by driver C5 of the Sound Input circuit. This signal is derived from Horizontal Timing Signal 2H and is the phase 2 clock signal for Sound Microprocessor D4-D7.

## **COLD**

Color Load is generated by J2 and applied as the clock input signal for D8.

## **COLOROM1-COLOROM2**

Color ROM Enables 1 and 2 are generated by Control Signal Latch D10 and applied to Color ROM Address Multiplexer J7.

## **COLSEL**

Color Select is taken from logic gate J6 of the Video Summation Logic and applied through Color ROM Address Latch K8 to the select input pins of Color ROM Address Multiplexers J7 and J8.

## **COMPSYNC**

Composite Synchronization Signal is taken from logic gate M8 in the Vertical Timing Chain and applied to the video display circuitry for further processing.

## **CR0-CR5**

Color Signals 0-5 are generated by Color ROM Address Latch K8 from signals CBIT0-CBIT5. CR0-CR5 are applied to Color ROM Address Multiplexers J7 and J8.

## **CRAM**

Control RAM Enable is generated by Game Microprocessor Address Decoder C12 and applied as the select input to Video Control RAM Address Multiplexers E13 and E14.

## **CRAMRD**

Control RAM Read is generated by Game Microprocessor Address Decoder C11 and applied through logic gate D9 as the read enable for the Video Control RAM.

## **CRAMWR**

Control RAM Write is generated by Game Microprocessor Address Decoder D11 and applied as the write enable for the Video Control RAM.

## **CS1-CS3**

Graphics ROM Chip-Select Enables 1-3 are generated from the CSA and GPHROM1 signals by logic gates E7, F6, and J4 of the Graphics ROM circuit.

## **CSA**

Graphics ROM Chip-Select Address is generated by Graphics ROM Address Multiplexer K13 and applied to logic gate E7 to develop CS1-CS3.

## **CSTM RD**

Custom RAM Read is generated by Game Microprocessor Address Decoder C11 and applied as the read enable for Custom RAM D16 and D17.

## **CSTMWR**

Custom RAM Write is generated by Game Microprocessor Address Decoder D11 and applied as the write enable for the Custom RAM D15 and D17.

## **D0-D7**

Game Microprocessor Data Bus is a bi-directional data bus between the Game Microprocessor and the Program Memory.

#### **DB0-DB7**

Game Microprocessor Buffered Data Bus is a buffered bi-directional data bus between Game Microprocessor Data-Bus Buffer B10 and C7 of the Sound Input circuit, Input Signal Buffers B6-B9, buffer H11 of the Video Control RAM, buffer H10 of the Video RAM, and Color ROM Address Latch J9. DB0 is also applied to Control Signal Latch D10.

#### **DIPSW**

Dip-Switch Read Enable is generated by Game Microprocessor Address Decoder C11 and applied as the read enable for Input Buffers B6 and B7.

#### **GPHROM1-GPHROM2**

Graphics ROM Enables 1 and 2 are generated by Control Signal Latch D10. GPHROM1 is used to develop CS1-CS3. GPHROM2 enables Graphics ROM J14, J17, L14, L17, M14, and M17.

#### **GREEN**

Green Video Output Signal is generated by Color ROM H8, buffered by Q2, and applied to the video display circuitry for further amplification and processing.

#### **HFLIP**

Horizontal Flip is generated by Control Signal Latch D10 and applied to logic gate A9 of the Horizontal Timing Chain to produce HFLIP1. HFLIP is also applied to Video Control RAM Address Multiplexer F10.

#### **HFLIP1-HFLIP2**

Horizontal Change Signals 1 and 2. HFLIP1 is generated by logic gate A9 of the Horizontal Timing Chain and buffered by E8 to produce HFLIP1B. HFLIP2 is generated by Video Control RAM Address Multiplexer F10 and buffered by E8 to produce HFLIP2B.

#### **HFLIP1B-HFLIP2B**

Buffered Horizontal Change Signals 1 and 2 are generated by E8 from HFLIP1 and HFLIP2. HFLIP1B is applied to logic gates K9 and M9 in the Motion Object RAM circuit to develop the input signals for Motion Object RAM L5-L10. HFLIP2B is applied to logic gate F14 of the Graphics ROM circuit to develop the S1 input signal for shift registers F15-F17 and H15-H17.

#### **HPIC0-HPIC7**

Horizontal Pictures 0-7 are generated by Video Control RAM L12 from the HVEC0-HVEC7 signals. The HPIC0-HPIC7 signals are applied to Graphic ROM Address Multiplexers K13 and L13. HPIC7 is applied through jumper J10 to logic gate D9 of the Motion Object Vertical Position Adders circuit.

#### **HVEC0-HVEC7**

Horizontal Vectors 0-7 are generated by F11 and F12 of the Video Control RAM and used by L12 to produce HPIC0-HPIC7. HVEC0-HVEC7 are also applied to H12 and H13 of the Motion Object Vertical Position Adders, and to K10 and M10 of the Motion Object RAM. HVEC0-HVEC2 are applied to D8.

#### **IN0-IN1**

Input Buffer Enables 0 and 1 are generated by Game Microprocessor Address Decoder C11 and applied to Input Buffers B7-B9.

#### **I/O LATCH**

Input/Output Latch is generated by Game Microprocessor Address Decoder D11 and applied as the enable input signal for Control Signal Latch D10.

#### **LOAD0-LOAD1**

Horizontal Load Signals 0 and 1 are generated by J2 from the Horizontal Timing Signals. LOAD0 is the load input signal for K10 and M10 of the Motion Object RAM. LOAD1 is gated with Horizontal Timing Signal 256HB by H6 to develop the clear input signal for K10 and M10 of the Motion Object RAM.

#### **MATCH**

Match is generated by Video RAM Address Multiplexer K11. MATCH is applied to the Graphics ROM circuit where it is gated with PLOAD by J6 to produce the S0 input signal for shift registers F15-F17 and H15-H17.

#### **MLOAD**

Motion Object Load is generated by J1 and applied as the clock input signal to the D-type flip-flops within L12 of the Video Control RAM.

#### **MREQ**

Game Microprocessor Memory Request is generated by the Game Microprocessor (A & B 11/12) and applied to Game Microprocessor Address Decoder D13.

#### **NMI ON**

Non-Maskable Interrupt On is generated by Control Signal Latch D10 and applied to F5 to clear the non-maskable interrupt latch for the Game Microprocessor.

#### **PIC0-PIC8**

Picture Address Bits 0-8 are generated by Graphic ROM Address Multiplexers K13, L13, and M13. The PIC0-PIC8 signals are applied to Graphics ROM J14, J16, J17, L14, L16, L17, M14, M16, and M17.

#### **PICBIT0-PICBIT2**

Picture Bits 0-2 are generated by multiplexer H14 of the Graphics ROM circuit and applied to F14, M5, and M6 of the Video Summation Logic.

#### **PLOAD**

Picture Load is generated by logic gate J3 and applied as the enable signal to E8. PLOAD is also applied to logic gate J6 of the Graphics ROM circuit.



## **Fast Freddie PCB Signal Name Glossary**

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## Descriptions of Signal Names for Fast Freddie PCB Schematic Diagrams (continued)

### **RAMSEL**

RAM Select is generated by Game Microprocessor Address Decoder D13 and applied to Game Microprocessor Address Decoders C11, C12, and D11.

### **RD**

Game Microprocessor Read is generated by the Game Microprocessor (A & B 11/12) and applied through driver C10 to Game Microprocessor Address Decoder C11, Game Microprocessor ROM Decoder A13, and to Data-Bus Buffer B10.

### **RDA**

Game Microprocessor Read Enable is generated by logic gate D12 of the Game Microprocessor Address Decoder circuit.  $\overline{RDA}$  is applied as the direction input signal for Data-Bus Buffer B10.

### **RED**

Red Video Output Signal is generated by Color ROM H9, buffered by Q4, and applied to the video display circuitry for further amplification and processing.

### **RESET**

Game Reset is generated by logic gates C8, E10, and F7 of the Game Microprocessor circuit from the  $\overline{WDR}$  signal and the RESET switch. RESET is applied to the Game Microprocessor (A & B 11/12), Sound Microprocessor D4-D7, Programmable Sound Generators B1 and B3, and Control Signal Latch D10.

### **RFSH**

Game Microprocessor Refresh is generated by the Game Microprocessor (A & B 11/12) and applied to Game Microprocessor Address Decoder C12.

### **ROM0-ROM7**

Program ROM Chip-Select Enables 0-7 are generated by Game Microprocessor ROM Decoder A13 and applied to the Program ROM.

### **ROMSEL**

Program ROM Select is generated by Game Microprocessor Address Decoder D13, gated by C9, and applied to Game Microprocessor ROM Decoder A13.

### **SA12-SA13**

Sound Microprocessor Address Lines 12 and 13 are generated by Sound Microprocessor D4-D7 and applied to Sound Microprocessor Address Decoders C3 and C4.

### **SAB0-SAB11**

Sound Microprocessor Buffered Address Bus is generated by Sound Microprocessor D4-D7, buffered by E4 and E5, and applied to the Sound Microprocessor Address Decoders and the Sound Memory.

### **SCMD**

Sound Command is generated by Game Microprocessor Address Decoder D11 and applied as the clock input for the D-type flip-flops within C7 of the Sound Input circuit.

### **SCMDRD**

Sound Command Read is generated by Sound Microprocessor Address Decoder C4 to enable drivers C5 and C6 of the Sound Input circuit.

### **SD0-SD7**

Sound Microprocessor Data Bus is a bi-directional data bus between the Sound Microprocessor and Sound Memory D2-D3, E1-E3, F1-F3 and Sound Input buffers C5C6. SD0 is applied to Sound Microprocessor Address Decoder H3 to produce SNMI.

### **SDB0-SDB7**

Sound Microprocessor Buffered Data Bus is a buffered bi-directional data bus between Sound Microprocessor Data-Bus Buffer C2 and Programmable Sound Generators B1 and B3.

### **SGA1-SGA4**

Programmable Sound Generator Control Lines 1-4 are generated by the logic gates within A4 of the Sound Microprocessor Address Decoder circuit and applied to Programmable Sound Generators B1 and B3.

### **SGON**

Programmable Sound Generator Write Enable is generated by logic gate B4 of the Sound Microprocessor Address Decoder circuit and applied to Sound Microprocessor Data-Bus Buffer C2.

### **SGW1-SGW3**

Sound Generator Control Lines 1-3 are generated by Sound Microprocessor Address Decoder C3 and applied to logic gate B4 to produce SGON. SGW2 and SGW3 are also applied to logic gate A4 to produce SGA1-SGA4.

### **SHF0-SHF5**

Pixel Bits 0-5 are generated by shift registers F15-F17 and H15-H17 of the Graphics ROM circuit and applied to multiplexer H14 to produce PICBIT0-PICBIT2.

### **SMREQ**

Sound Microprocessor Memory Request is generated by Sound Microprocessor D4-D7 and applied to Sound Microprocessor Address Decoders C3 and C4.

### **SNMI**

Sound Microprocessor Non-Maskable Interrupt is generated by H3 of the Sound Microprocessor Address Decoder circuit and applied to F4 to clear the nonmaskable interrupt latch for the Sound Microprocessor.

### **SRAMCS**

Sound RAM Chip Select is generated by logic gate B4 of the Sound Microprocessor Address Decoder circuit and applied to Sound Memory D2 and D3.

### **SRD**

Sound Microprocessor Read is generated by Sound Microprocessor D4-D7 and applied to Sound Microprocessor Address Decoder C4.

#### **SROM0-SROM1**

Sound ROM Chip-Select Enables 0-1 are generated by Sound Microprocessor Address Decoder C4 and applied as the select input signals to Sound Memory E1-E3 and F1-F3.

#### **SWR**

Sound Microprocessor Write is generated by Sound Microprocessor D4-D7 and applied to Sound Microprocessor Address Decoder C3 and to Sound Memory D2-D3.

#### **VBLANK**

Vertical Blanking (active HIGH) is generated by F5 of the Game Microprocessor circuit and applied to logic gate J6 of the Horizontal Timing Chain to produce BLANK.

#### **VBLANK**

Vertical Blanking (active LOW) is generated by F5 of the Game Microprocessor circuit and applied as the clock input signal to counter C8 of the Game Microprocessor circuit. VBLANK is also applied as the clear input signal to C10 and to the D-type flip-flops within J12 of the Motion Object Vertical Position Adders circuit.

#### **VFLIP**

Vertical Flip is generated by Control Signal Latch D10 and applied through driver C10 to logic gates H5 and J5 of the Vertical Timing Chain.

#### **VPL**

Vertical Position Load is generated by J2 and applied as the clock input signal for the D-type flip-flops of J12 in the Motion Object Vertical Position Adders circuit.

#### **VRAM**

Video RAM Enable is generated by Game Microprocessor Address Decoder C12 and applied to logic gate B11.

#### **VRAM0-VRAM7**

Video RAM Output Data 0-7 is generated by Video RAM J10 and J11 and applied to Graphics ROM Address Multiplexers K13, L13, M13.

#### **VRAMRD**

Video RAM Read is generated by Game Microprocessor Address Decoder C11 and gated with VRAMWR by C9 of the Video RAM circuit to produce the read enable signal for H10 and K11.

#### **VRAMWR**

Video RAM Write is generated by Game Microprocessor Address Decoder D11 and gated with VRAMRD by C9 of the Video RAM circuit to produce the write enable signal for H10 and K11. VRAMWR is also the write enable signal for Video RAM J10 and J11.

#### **WAIT**

Game Microprocessor Wait is generated by C10 and applied as the wait input signal to the Game Microprocessor (A & B 11/12).

#### **WDR**

Watchdog Reset is generated by Game Microprocessor Address Decoder C11 and applied to logic gate F7 of the Game Microprocessor circuit.

#### **WEN**

Write Enable is generated by C10 and applied to Game Microprocessor Address Decoder D11.

#### **WR**

Game Microprocessor Write is generated by the Game Microprocessor (A & B 11/12), buffered by logic gate C10, and applied to Game Microprocessor Address Decoder D11 and to Custom RAM D15-D17.

#### **WRKRAM**

Working RAM Enable is generated by logic gate C9 of the Game Microprocessor Address Decoder circuit and applied to Custom RAM F15-F17.

#### **1H-256H, 1H, 256HB**

Horizontal Timing Signals are generated by the Horizontal Timing Chain and used throughout the game circuitry.

#### **8HAD-128HAD**

Horizontal Address Signals are generated by the Horizontal Timing Chain and applied to Video Control RAM Address Multiplexers E13, E14, F10, and to Video RAM Address Multiplexers L11 and M11.

#### **6 MHz, 6 MHz**

6-MHz Timing Signals are generated by the Crystal Clock circuit and used throughout the game circuitry.

#### **16V-128V**

Vertical Timing Signals are generated by the Vertical Timing Chain and applied to J3 and F5 of the Game Microprocessor circuit and to J4 and F4 of the Sound Microprocessor circuit.

#### **1VAD-128VAD**

Vertical Address Signals are generated by the Vertical Timing Chain and applied to Motion Object Vertical Position Adders H12 and H13.



## **Fast Freddie PCB Signal Name Glossary (continued)**

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# **Schematic Notes**

Unless otherwise specified

Resistance: ( $\Omega$ ) (K $\rightarrow$ K $\Omega$ , M $\rightarrow$ M $\Omega$ ), 1/4 (W) carbon resistor

Capacitance: 1 or higher  $\rightarrow$  (pF), less than 1  $\rightarrow$  ( $\mu$ F)

working voltage  $\rightarrow$  50 (V)

ceramic capacitor

Inductance: ( $\mu$ H)

Electrolytic Cap: Capacitance Value ( $\mu$ F)/working voltage (V).

NP  $\rightarrow$  non-polar (or bipolar) electrolytic cap.

Refer to the parts list for additional component information.

⊙ indicates test point connection

⊥ indicates chassis ground unless otherwise specified

Hz indicates cycles per second

For safety purposes (and continuing reliability)

⚠ replace all components marked with safety symbol with

identical type.

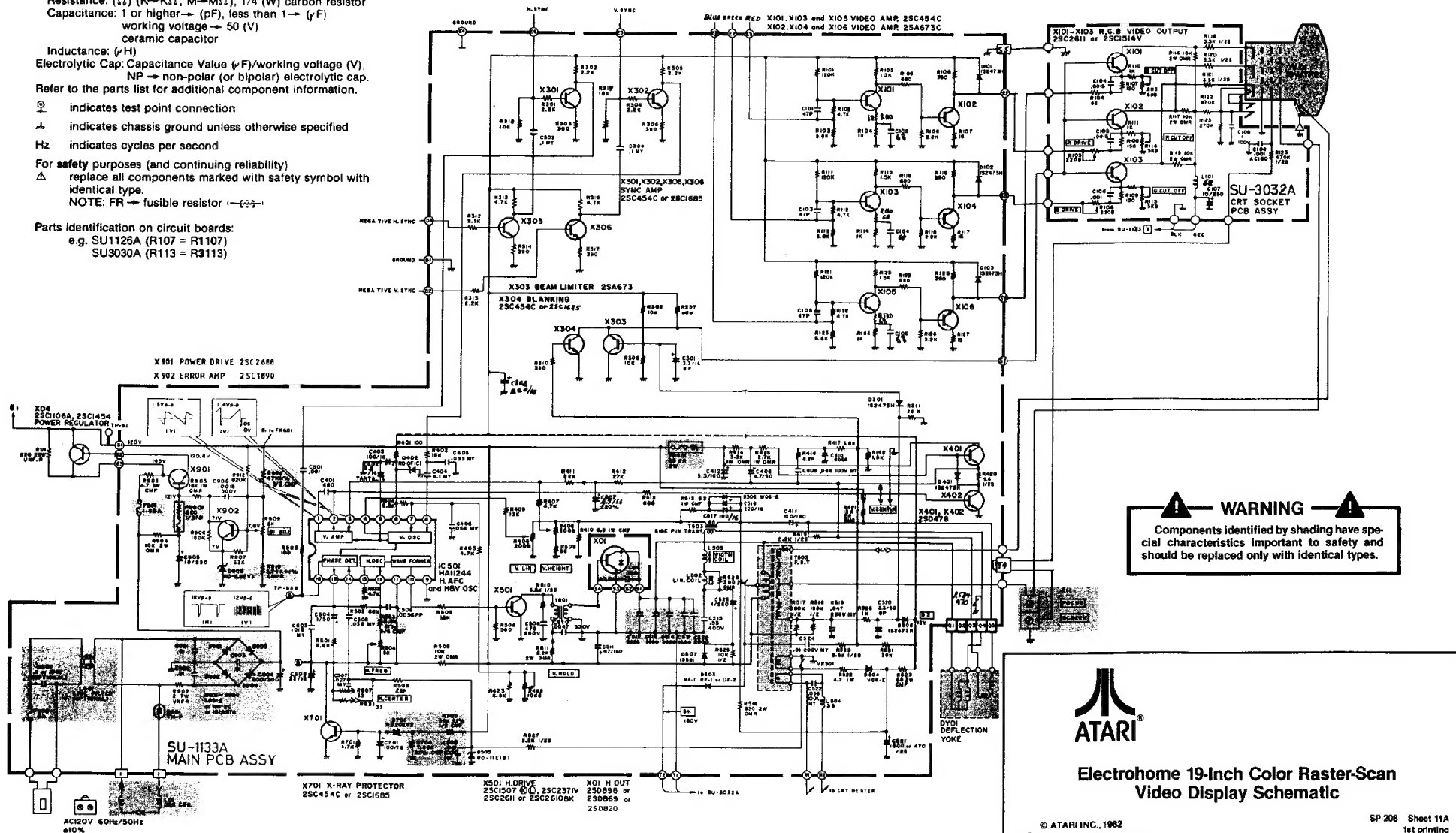
NOTE: FR  $\rightarrow$  fusible resistor ( $\rightarrow$ )

Parts identification on circuit boards:

e.g. SU1126A (R107 = R1107)

SU3030A (R113 = R3113)

## **Electrohome 19-Inch Color Raster-Scan Video Display Schematic Diagram**



**WARNING**  
Components identified by shading have special characteristics important to safety and should be replaced only with identical types.



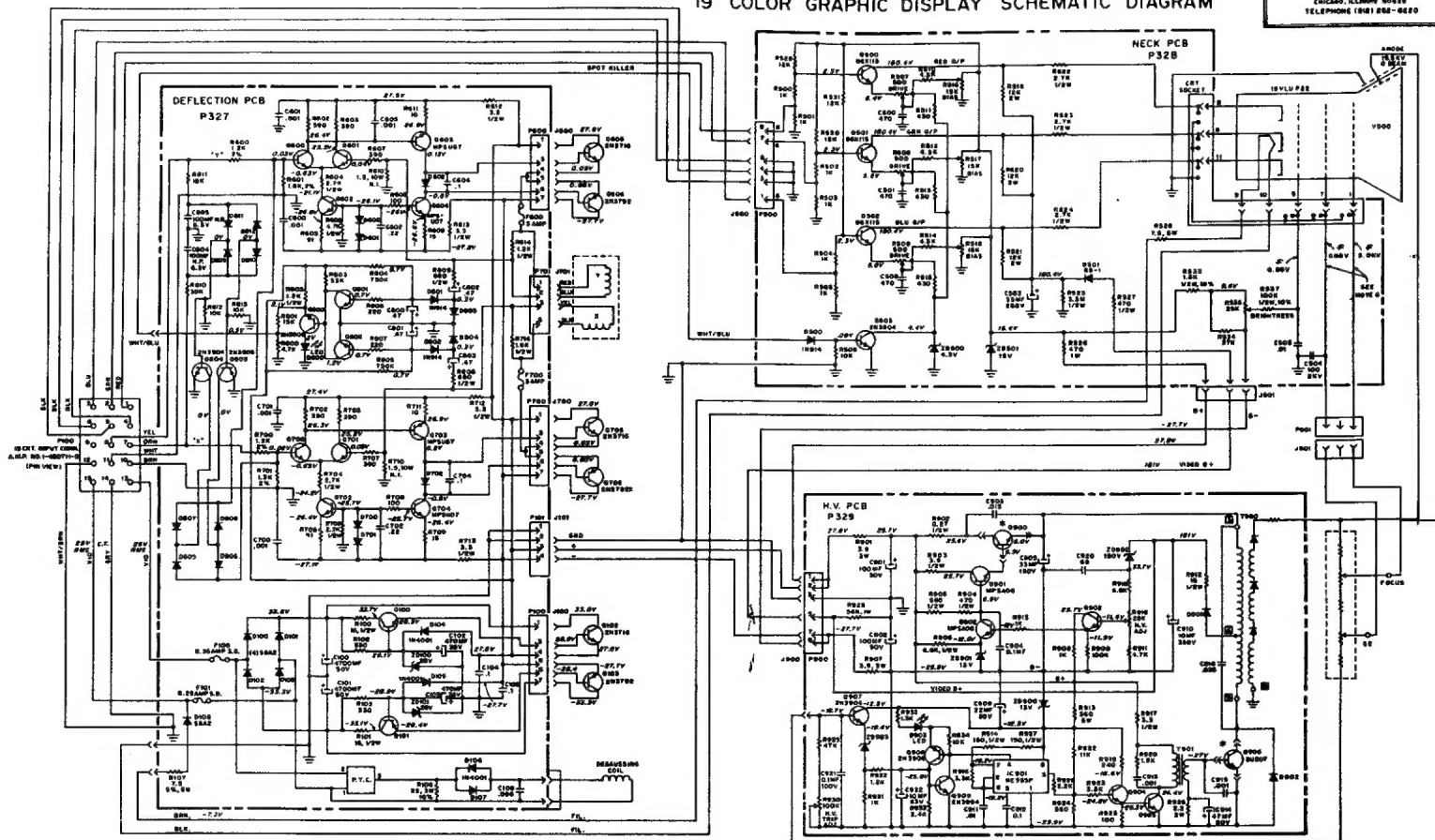
**Electrohome 19-Inch Color Raster-Scan Video Display Schematic**

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# 19" COLOR GRAPHIC DISPLAY SCHEMATIC DIAGRAM

WELLS-GARDNER ELECTRONICS CORP.  
CHICAGO, ILLINOIS 60639  
TELEPHONE (312) 852-8220



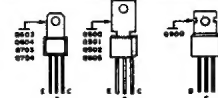
## GENERAL NOTES:

1. RESISTANCE VALUES IN OHMS (Ω) UNLESS OTHERWISE NOTED. K=1,000, M=1,000,000
2. CAPACITANCE VALUES OF 1.00 OR LESS IN MICROFARADS, ABOVE 1.00 IN MICROFARADS UNLESS OTHERWISE NOTED.
3. 3. 3000 AND 0000 ARE NOT ON M.F.C.S.

4. ALL D.C. VOLTAGES ARE MEASURED FROM POINT INDICATED TO GROUND WITH A HIGH IMPEDANCE METER. VOLTAGES ARE MEASURED WITH NO SIGNAL INPUT AND CONTROLS ARE IN A NORMAL OPERATING POSITION
5. CIRCLED NUMBERS INDICATE LOCATION OF WAVEFORM READINGS.

6. USE A 1,000:1 PROBE WHEN MEASURING SCREEN OR POCUS VOLTAGE.
7. IF VOLTAGES VARY WITH CONTROL SETTINGS.

COLLECTOR CONNECTED TO CASE



19K6102-5635



Wells-Gardner 19-Inch Color Raster-Scan  
Video Display Schematic

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